



IMPROVED PIR MOTION SENSOR

PRIORITY CLAIM

This is a continuation-in-part of U.S. patent application serial no. 10/388,862, filed March 14, 2003. Priority is also claimed from U.S. provisional application serial no. 5 60/441,571, filed January 21, 2003.

I. Field of the Invention

The present invention relates generally to motion sensors.

II. Background of the Invention

Motion sensors are used in security systems to detect movement in a monitored space. One type of sensor is a passive infrared (PIR) motion sensor, which detects changes in far infrared radiation (8 - 14 micron wavelength) due to temperature differences between an object (e.g. a human) and its background environment. Upon detection, motion sensors generally transmit an indication to a host system, which may in turn activate an intrusion "alarm", change room lighting, open a door, or perform some other function.

One way to provide motion sensing capabilities is to provide an infrared camera. Motion in the monitored space can be tracked easily by observing the output of the camera. However, such cameras are expensive. Hence, the need for simple, relatively inexpensive PIR motion sensors, using, e.g., simple pyroelectric detectors. Because the detectors can be a significant part of the cost (5 - 10%) of a typical PIR motion sensor, most PIR motion sensors employ only one or two such detectors.

To monitor a large space with only one or two detectors, a typical PIR motion sensor is designed with multiple optical components (e.g. lenses or mirrors). Each component of such "compound optics" focuses the infrared radiation from objects within a respective sub-volume of the monitored space into an image appearing over the detector. The monitored sub-volumes can be interleaved with non-monitored sub-volumes, so that a radiation producing target (e.g., a human) passing from sub-volume to sub-volume causes a "target